

**Notice of Allowability**

Application No.

10/612,336

Examiner

Patricia L. Hailey

Applicant(s)

LU ET AL.

Art Unit

1755

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to an amendment filed on June 28, 2005.
2. ☒ The allowed claim(s) is/are 1-7.
3. ☒ The drawings filed on 03 July 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

Applicants' remarks and amendments, filed on June 28, 2005, have been carefully considered. Claim 8 has been canceled; no new claims have been added.

Claims 1-7 remain pending in this application.

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Document was filed on July 3, 2003.

### *Withdrawn Objections and Rejections*

The objection to the Drawings set forth in the previous Office Action has been withdrawn in view of Applicants' amendment to the Specification.

The 102(b)/103(a) rejection of claim 8 as being anticipated by or, in the alternative, unpatentable over Li et al. (U. S. Patent No. 5,552,245), stated in the previous Office Action, has been withdrawn in view of Applicants' cancellation of this claim.

### *Allowable Subject Matter*

2. Claims 1-7 are allowed.
3. The following is an examiner's statement of reasons for allowance:

The prior art of record does not teach or reasonably suggest the claimed process for preparing a non-platinum composite electrocatalyst, wherein a carbon-supporting

titanium dioxide is prepared and compounded with a transition metal macrocyclic compound in an organic solvent, and the resulting mixture is thermally treated at 100°C to 1000°C.

While titanium dioxide supported by carbon is known in the art, its combination with a transition metal macrocyclic is not.

Golovin et al. (U. S. Patent No. 5,733,677) teach a cathode comprising carbon black, polytetrafluoroethylene, and titanium as a metal current collector (col. 4, lines 14-32).

Dhar (U. S. Patent No. 5,521,020) teaches a catalytic material comprising platinum as a catalyst for the hydrogen electrode, and either platinum or another oxygen reducing catalyst such as a macrocyclic chelate. Dhar also discloses titanium as an alternate support or carrier for the catalytic material. See col. 6, lines 5-30 of Dhar.

Therien et al. (U. S. Patent Application Publication No. 2003/0166921) relates to synthetic multiporphyrin and multimacrocyclic systems that bind metal ions. Cofacial (porphinato)metal compounds demonstrating excellent utility in catalyzing multielectron redox transformations are shown to function as homogeneous or heterogeneous catalysts, or as electrocatalysts.

Langford et al. (U. S. Patent No. 4,806,514) teach a composite photocatalyst comprising particles of a semiconductor material (e.g., titanium oxide), said particles coated with a polymer film comprising a pyridine-containing polymer and a divalent metal porphyrin or phthalocyanine-based dye.

Ziener et al. (U. S. Patent No. 3,821,028) disclose catalysts for fuel cell electrodes comprising metal chelates of copper, iron, cobalt, or nickel; exemplary chelates include 5,14-dihydro-dibenzo (5, 9, 14, 18)tetraaza(14)-annulene or an electrochemical oxidation product thereof. While this catalyst can be mixed with a conductive material such as carbon black or activated carbon, and formed as a suspension in a polymethacrylic acid ester dissolved in an organic solvent, said suspension then being applied to a carrier disk (e.g., titanium-palladium disk), the reference does not teach or suggest the employment of a carbon-supporting titanium dioxide.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

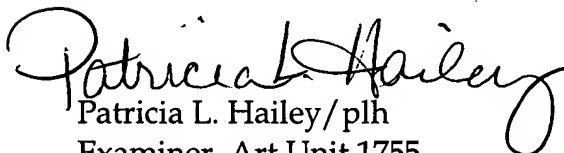
### *Conclusion*

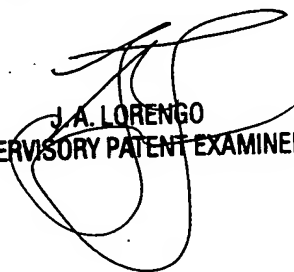
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia L. Hailey whose telephone number is (571) 272-1369. The examiner can normally be reached on Mondays-Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Patricia L. Hailey/plh  
Examiner, Art Unit 1755  
August 29, 2005

  
J.A. LORENZO  
SUPERVISORY PATENT EXAMINER